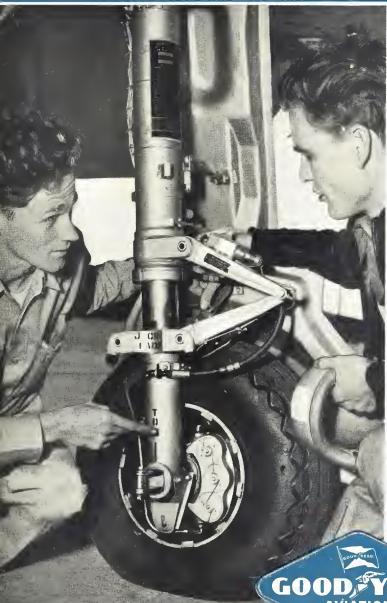


AVIATION WEEK

MAY 1, 1950

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Aviation Week

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WHO'S WHERE

In the Front Office

At a special equidistance meeting of Cato-Wright Corp.'s board, the following officers were reappointed: Paul V. Stettin, chairman; Roy T. Huley, president; Joseph F. McCarthy, vice-president; Wm. G. Edwards, M. Doss, vice-president; George R. Hill, controller; and Peter J. Mosley, Jr., treasurer. At company's regular annual meeting the following directors were named: Edwin J. Brunsell, T. Edmund Roberts, Edgar J. Brown, J. Clarence Cowdin, Lee Y. Crowell, Charles A. Dunn, Roy T. Huley, Robert W. Lee, Joseph F. McCarthy, John A. McGee, Joseph A. Reed, Ed. W. Shedd, and Henry S. Soupe.

Fitts Research has been made up of KLM (Royal Dutch Airlines) general technical production according to the late H. Vennedahl, and E. J. Van Bollen is now in general operation according to the late H. Fuchs.

Roger F. Eudick, with American Airlines' immediate division 14 years, has been named director of maintenance and chief officer.

Edward Bell has been made executive engineer of French Helicopters Corp., and will improve business details of aviation and administrative portions of the company's engineering dept. Before going to that office, he was with Glenn L. Stetten Co., Rogers Aircraft Co., and Security Aircraft Inc. (now Republic Aircraft Corp.).

Changes

Gordon Hennes has been appointed American Aircraft Corp. and sales and service manager to handle all aircraft activities, sales, production, delivery and shipping.

Gunter E. Lockman has been made chief production manager for Pirelli.

R. D. Russell and Erik Nelson have been appointed sales, after manager and sales manager, respectively, of Grumman, Ltd.

Wood T. Henry has been named to the newly created post of director of research activities at American Polytechnic Institute.

Robert A. Noddling has been appointed general manager of Transport Equipment, Co., Bethesda. He was formerly assistant at Navigation Maintenance Corp. and Lockheed Aircraft Service.

At the Airline-W. E. Golden has been named newly created post of chief flight manager for National Airlines and will be in charge of station planning and training.

Robert G. Strong in Sperry's new post to general sales activities, promotion and research.

John F. Robinson has been appointed Texas World Airlines city sales manager in Dallas. Edward J. Whitney of Western Air Lines has been promoted to district sales manager for Wyoming and Montana.

Saying Good-By

Capt. J. Lawrence Pritchard, secretary of the Royal Aeronautical Society for 25 years, a retiring one. He was also editor of the RAE's journal since 1919. Left February 25, Capt. Pritchard celebrated his 65th birthday.

INDUSTRY OBSERVER

• American Airlines is experimenting with automatic instrument approach utilizing the Sperry A-12 instrument pilot with two ICAI's already equipped with the system and others continuously scheduled. First tests have indicated that the weak factor on the automatic pilot cannot produce structural damage to the airplane or impose control forces which the human pilot cannot counteract.

• Old controversy between instrument landing system (ILS) and ground control approach radio (GCA) is still alive, as indicated by the Plan of Air Navigation Development Board to study Automatic GCA (Aviation Week April 5) and 1945 for the change program, automatic using ILS, emergency and distance measuring equipment.

• British Flight magazine shows photos and reports details of the U. S. Navy auxiliary system for spotting submarines from the air, a description of the British anti-submarine plane fleet, equipped with 12 American AN/ARR-3 sonobuoys, with transmitting range of approximately 12 miles. Sonobuoys are dropped by parachute, as quantity need is interpreted soon. Strength of radio signals from the sonobuoys varies with distance from submarine, enabling plane to plot position of submarine.

• New production version of the Boeing B-47 Stratojet of which 52 are ordered in 1945 USAF procurement will, according to carrying dropable wing tanks, and additional internal fuel tanks. Minimum gross takeoff weight is increased to 115,000 lb. (Boeing started with a very low gross takeoff weight of 125,000 lb. for the XB-47). A multi-million dollar nuclear reactor (atomic as principle in first test in the G-10) will be installed to provide auxiliary power. New NATO device gives 20,000 lb. thrust for takeoff as compared to 18,000 lb. thrust of the JATO units.

• Industrial Aircraft is continuing to buy eight Cessna 440s out of the 15 which Cessna has turned over to its subsidiary Air Fleet for disposal. Meanwhile another Cessna-Lear deal is in the making with Ethelberg Aircraft.

• An audio-encoding system is expected to be selected as the most satisfactory method of airport traffic direction equipment, in addition to the airport ground control system when an airport is built. System probably would be wired to a Micro Switch on the plane's landing gear, so that a signal would be generated when the gear touched the ground. Signal would be received through a controller's panel which may be visible to those used by trained dispatchers to show movement and position of planes.

• Royal Canadian Navy has completed arrangements for purchase from U. S. government of enough Canadian Avenger torpedo bombers to equip two anti-submarine squadrons.

• Douglas Aircraft Navy torpedo attack plane is completing testing today and is due to make its first flight probably within the next 10 days, following its delivery after the first Navy torpedo plane flight of the Grumman XF6F-1 fighter-bomber. Also an Alouette T-40 double turbine installation, testing a six-blade propellers counter-rotating propellers, similar to the four T-40s on the XF6F-1.

• New upperdeck cargo door and increased payload now quoted at 60,000 lb. are features of the newest Boeing C-97 Stratofreighter, 14 of which are ordered in USAF 1946 procurement. Cargo can be loaded by fork lift through new upper door; in addition to rear cargo doors and ramp loading arrangement.

• The 90 Grumman Garden AF anti-submarine plane ordered in Navy's 1950 procurement program claim the designation of the largest single-engine plane currently being. Plane weighs 16,000 lb. empty, sheet 100 ft. more than the Boeing AM-1 Maslin, its closest competitor.

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Vol. 32, No. 18

AVIATION WEEK

May 1, 1959



SUPER CONSTELLATION with longer fuselage, jet exhaust stacks and new windows, (above) is Lockheed's modernization of . . .



PRESENT CONNIE type. Douglas, Boeing, Convair and Martin also plan to modify their transports for greater speed and load.

Super Connie Leads New Transport Plans

By Charles Adams

U. S. aircraft manufacturers are turning over one another with new plans for improving performance of existing transports during the four or five-year period before jets make a serious competitive challenge in the commercial field.

Latest developments come from Lockheed and Boeing which have new versions of the Constellation and Stratocruiser. Lockheed already has wrangled

an order, with Eastern Air Lines buying ten Model 1049 "Super Constellations" that will be 18 ft longer than existing types, have more powerful engines, and be able to carry 52 passengers.

Airline Attitude—The airlines generally favor the manufacturers' stretch-out program—especially in view of the government's reluctance to finance development of jet transport prototypes. Carriers feel that if they must spend their limited funds for new equipment during the next few years, replacements

of present transports offer the best return for the money.

Meanwhile, Douglas, Martin and Convair also have worked out plans of getting more out of existing transport airframes through installation of turbo-prop, lengthening fuselages, or both. What's happening in the transport field in many respects parallels the military evolution of the B-36, which began for obsolescence several years ago, has passed a new lease on life with auxiliary turbojet engines.



BY FOD STRATOCRUISER is possible next development of Boeing to increase performance of its transport (see chart, page 11).

Some observers expect a note of caution as they watch the trend. They question, for instance, whether using transports are streamlined for the greater gain leads likely to be recognized at higher speeds. The Air Line Pilots Assn. especially has voiced opposition over its step-up the maximum gross weight of present aircraft.

Let Ford Stratocruiser-Boeing has been announced officially that it views the addition of two auxiliary pod-mounted turbojet engines to its Stratocruiser as the next possible step in the further development of the double-decked transport (AERONAUTICS WEEK Mar. 11). This would increase the B-57's cruising speed from 300-340 mph to 360 mph, and would boost the gross weight from the present 140,700 lb. to 155,000-165,000 lb.

The auxiliary jet pods (probably Westinghouse J-36 rated up to 1400 thrust-pounds each) would be installed on the wing. The Stratocruiser's four 3200-hp Pratt & Whitney Wasp Main jet compressing engines. Boeing previously had announced other tentative plans for replacing the piston-type engines with four turbojets to give the B-57 (and its C-97 siblings transport counterpart) more speed, range, payload.

This second-in transport step-in the program development of the Stratocruiser would include a 1040-lb-longer fuselage. The gross takeoff weight would rise to 165,000 lb. and cruising speed would be 360 mph.

Beyond the turbojet Stratocruiser, Boeing plans a turbojet craft—probably a passenger wing, jet pod plane with a maximum speed of 390 mph. D. A. Buck, Boeing sales engineer, recently

detailed a 75-passenger, low-wing turboprop with 140,000-lb maximum gross weight and capable of flying 1800 mi. (equal to Chicago-Dallas) with full payload and adequate fuel. •Genuine Side-Loaded Super Cessna vehicles will cut Eastern Air Lines over 50,000-50,000 miles. Total jump for the ten stage with four pods and engines a 514 mph.

The Model 10498 will have a maximum gross weight of about 116,000 lb. roughly 9000 lb. more than the current Model 749A, Conquestair. First commercial carrier—the Model 1498—was rated at only 90,000 lb. maximum gross takeoff weight.

EAL's new ships, which are expected to go into service by the fall of 1955, will have Wright R-3533 C32C1 engines developing a total of 11,000 hp. This equates a 3000 hp. total power increase over EAL's present Conquest. As a result, the cruising speed is expected to jump from 300 to 310 mph. [A new jet engine test installation is being mounted as for a 32-31 mph increase in cruising speed to 32,000 ft.] Takeoff, climb and landing characteristics of the new transport are expected to be almost identical with present Conquest, on which EAL has accumulated over two billion passenger-miles.

EAL President E. V. Kieckhefer said the Model 10498 would have increased visibility through use of square cabins windows, improved sound proofing, and advancements in air conditioning and temperature control. But he stressed that despite these advancements the Super Cessna would still show its full capabilities for three or four years. •Turbojet Prop—“At that time,” Kieckhefer explained, “it is planned

to equip them with improved Allison turboprop engines. Four of these engines of 3500 hp each will increase the total horsepower per plane to 14,000 and the speed to 400 mph.” (The Allison T-35 is now rated at 2730 hp.)

The EAL president predicted that Super Conquestair with turboprops would be an ideal “stepping” by the end of 1954 and certainly not later than 1957.” He said the turboprop craft would be able to fly 91 passengers from New York to Miami in three hours.

Lockheed officials note that the EAL Center is only one of a score of new versions designed to cut from 46 to 102 passengers. The Model 10498 is not the last of the Model 949 (planned with conventional engines) which Lockheed had under development for potential military and commercial use. The Model 949 also was designed with the extended fuselage.

•Douglas Progress-Development at Douglas in many projects parallel Boeing and Lockheed plans for modifying existing transports with turboprops and high-density seating arrangements. Douglas early has put solid use of its DC-60 to United Air Lines and 11 to American. Like the Super Cessna, the DC-60 has a longer fuselage (by five ft.), more powerful engines, and can seat up to 92 passengers.

Douglas said its DC-60 is an admirably suited to turboprop installations, and both American and United have expressed great interest in the idea. (American is reported to have obtained a Navy contract to modify a DC-60 for turboprops.) UAL President W. A. Patterson declared recently that turboprop engines “will definitely introduce a new era in air transportation.”

	B-377	B-377 + JETS	B-377 TURBO PROP	JET TRANSPORT
Gross Weight	145,000 lbs.	155,000-165,000 lbs.	145,000 lbs.	145,000 lbs.
Wing Loading				
Takeoff	84 lb/sq ft	80-85 lb/sq ft	95 lb/sq ft	82 lb/sq ft
Landing	65 lb/sq ft	68 lb/sq ft	47 lb/sq ft	47 lb/sq ft
Maximum Gross Load	72,000 lbs.	76,000-83,000 lbs.	81,000 lbs.	70,000 lbs.
Tire Pressure	180 PSI	—	—	135 PSI
Allowable Cross Wind Landing	40 mph	40 mph	40 mph	30 mph
Payload	18,040 lbs.	18,040 lbs.	22,000 lbs.	20,000 lbs.
Passengers	61-72	61-72	73-87	73
Cargo Wt./Passenger	16.3-19.6 cu ft	11.3-15.7 cu ft	12 cu ft	10 cu ft
Height of Cabin Door	50 ft	50 ft	10 ft	10 ft
Height of Cargo Door	5 ft	5 ft	5 ft	8 ft
Span	140 ft	141 ft	141 ft	139 ft
Length	105 ft	130 ft	130 ft	104 ft 3 in.
Height	38 ft 3 in.	38 ft 3 in.	38 ft 3 in.	38 ft 3 in.
Wing Area Added	34 ft 7 in.	34 ft 7 in.	34 ft 7 in.	34 ft 7 in.
Gross Load	26 ft 6 in.	26 ft 6 in.	26 ft 6 in.	50 ft (Douglas)
Wheel Turning Diameter	78 ft	78 ft	78 ft	73 ft
Airplane Clearance Diameter	170 ft	170 ft	170 ft	175 ft
Fuel Capacity	7796 gal.	9196 gal.	9196 gal.	30,000 gal.

PROGRESSIVE PLAN for development of the Stratocruiser up to gross jet is shown in these Boeing calculations.

He said United would look seriously on the purchase of four turboprop engines for use on an experimental stage plane. But he added that the turboprop engines probably will not be in quantity production for at least two years.

Herbly View-United's Vice President-Operations, J. A. Herbly, has pointed up the need for progressive development of existing transports if U-8 manufacturers are to make many new ships before completely new turboprop and turbojet craft become available. He said it did not consider that any company can safely undertake the financial risk of having any additional type of conventional piston engine aircraft, except as they already are in service, obsolete by turbine-powered transport.

Douglas officials have stated that one of the reasons the Mexican airline Compañia Mexicana de Aviación and the Cuban airline Lineas Aereas Nacionales plan to order the DC-60 was because of the craft's adaptability to the turboprop. It is estimated that installation of four Allison T-38 turboprops on the DC-60 would increase the ship's cruising speed by 75 mph. (Aerobics Week Jan. 14.) Another are deeply interested in the scheduled line debut of an experimental cargo Convair-Lear which is slated to fly with two Allison T-38s. Martin, which recently sold 65 of its new engine Model 40-A turboprops to Eastern and TWA, has described the ship as “the first production aircraft

designed for conversion to turboprops.”

Waiting Interval—Some industry officials note, however, that there will be a substantial interval between current turboprop experiments and actual use of the new ships in scheduled service. Donald Douglas agrees with Rockwell that 1954 is a likely date for introduction of the turboprop aircraft. How much turboprop engines in quantity production will not be a subject of speculation.

Even so, Douglas has announced turboprop plans for the C-124A Globemaster II as well as for the DC-7. The C-124A is a development of the C-74 and is capable of carrying heavier loads. Douglas made a brief study of the C-74 powered with Allison T-40 turboprop engines, but this project has been abandoned in favor of the C-124 conversion.

If the proposed speed from the military were given over, the Douglas company believes it could be a turbojet turboprop C-124 in about 25 months. No high-density seating arrangement has yet been proposed for the turboprop version of the C-124.

PAA Sales Interest—When Douglas was asked on brief study of a turbojet C-74, some months ago, the American Airways expressed interest in such a craft with a high-density seating arrangement. But neither the airline nor Douglas has pursued the idea. Douglas' Long Beach (Calif.) plant is currently working on an order for 60 C-124s with piston engines. A proto-

type is flying, and the first production model of the C-124 will be delivered this year. The ship will be used as a strategic support transport, a ground and tactical heavy cargo carrier, and a tactical Air Command cargo and troop carrier.

A design which fitted the 8000-lb. Wright T-35 turboprop to the C-74 (Globemaster II) was developed by Douglas' Long Beach engineering staff as early as January, 1946. Then, in 1947, a design study for outfitting the smaller and lighter Pratt & Whitney PT series turboprops on the C-74 was begun.

When the C-124A Globemaster II was introduced and in 1948) was placed by the Air Force in quantity, immediate steps were taken to combine research on turboprop and turbojet to present the USAF the latest step to present the USAF to achieve continued growth and utility with a production aircraft. The C-124A is now designed to carry a 50,000-lb. payload 575 statute miles and return to base within 100 minutes. It is powered by four P-W R-4600 2000 WHP Major engines providing 1200 hp each for thrust.

Eagles Studied—In July, 1948, preliminary design work started on another P-W PT-3 as the Allison XT-40 turboprops. Douglas said these studies indicated definitely that, provided the engines proved their type tests in accordance with manufacturers' expectations, the gain in weight saving and performance of an eventual

• **Guided missiles** "offer great possibilities in the field of airborne armaments to destroy enemy aircraft." Progress in air-to-air transfer has been "improving" and "future fighters at some stage will have such weapons as their principal armament."

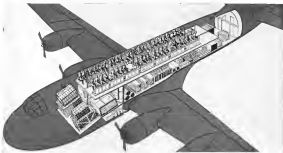
There is little justification for the hope of "severely through guided missile defense." The development of a long-range offensive guided missile, especially one launched from an airplane, is following "slowly the

development of a short-range defense missile."

Of USAF's total of 10,250 combat planes, 6,346 or more than 60 percent are World War II types which will be obsolete by the end of the 1951 fiscal year. Of USAF's total of 11,800 planes, 11,000 are in use and 9,000 in storage.

An increase is urged in USAF's officer strength of 19,797. USAF's authorized officer strength of 21,714 compares with 20,280 for the Army and 24,681 for the Navy.

The Secretary of Defense has recommended that the President reduce 578 positions in that organization on three facilities at USAF's Air Engineering Development Center in Tuscon, Arizona. These are a high-altitude engine test facility, a hypersonic wind tunnel, and a supersonic wind tunnel. Of the 578 positions appropriated for the project, USAF to date has spent about \$1 million on planning and research for these facilities at AEDC.



DOUGLAS C-124A Globemaster II, carrying large numbers of troops and equipment, can coordinate missions.

Air Transportability Gets a Test

'Operation Swearer' helps AF, Navy appraise current aircraft types and guide fiscal 1951 expenditures.

By Ben S. Lee

Camp Mackall, N. C.—Behind the scenes of the high altitude and ground support air maneuver that was Operation Swearer, the Air Force, and in a lesser extent the Navy last week were quietly conducting a thorough appraisal of their currently available fighters, light bombers and ability and transport planes.

Real significance of the operation, even more than providing a demonstration of strategic airlift, was to provide a new yardstick, expected to govern largely the allocation of fiscal year 1951 expenditures for Air Force and Navy Air. For performance of air craft at Swearer is to be used in evaluating factors determining needed aircraft allocations. And the projected

scenarios in an report to Defense Secretary Johnson's call for new strategic transporters for all combat aircraft with the accompanying statement that he considers during USAF-Navy planning session for aircrafting current plans, "obsolete."

• **Fighters and Bombers**—Current guidance fighters and attack aircraft under scrutiny of the evaluation teams at Operation Swearer were North American F-86, Republic F-84, Lockheed F-80, RF-80, Vought F4U, F4U-8 and Douglas A-1A and AD-5. North American two-seat F-47 was the only current light bomber aircraft under evaluation although the Douglas RB-26 bomber was used in several missions.

Transport aircraft used in the air transport were Douglas C-53 and C-119, Curtiss C-46, Douglas C-54 and

C-74. Navy had one Lockheed P2V patrol bomber in the maneuver.

Participating in Operation Swearer were 77 B-16 fighters, 151 F-84, 25 F-51 (National Guard), 25 F-47 (National Guard), 21 F-80, 1 F-4U-5, 60 F-4U, 35 AD-4 and 4 AD-5 planes. In the light bomber class there were 32 B-26, 16 RB-26 and 1 P-2V. In the transport class there were 45 C-52, 45 C-119, 51 C-46, 91 C-54 and 7 C-74 transports.

• **New Types**—More interesting to many Air Force and industry observers than the fairly well known performance of current types was the flight display at nearby Pope AFB, N. C., of new transport and cargo planes, gliders and helicopters, some of them shown publicly for the first time including:

• **Douglas C-124A**, four-engine cargo transport developed from the C-74, rated as a cargo plane for the USAF, and capable of a 50,000 lb. payload, with wide versatility of utilization. The C-124A was the largest transport at Swearer.

• **Northrop B-2K**, B-2K is a multi-engine transport with 8000 lb. payload.



NORTHROP B-2K, USAF's newest light transport, shown in one flight photo.

• **Five Close Aircraft** plans including the C-45 glider (10,000 lb. payload), the C-35 glider (16,000 lb. payload) and the Assault transport variants of these gliders, the C-121G-18 with two Wright R-1820-16 engines, and the NC-121C-30 with two Pratt & Whitney R-2600 engines.

• **Boeing's C-97 Strato-Lifter**, multi-compression to a C-124 for medium transport.

• **Helicopters** including Pando's HRP-1 Navy F-100, Sikorsky's USAF H-19 and Bell's USAF YH-12 (None of the helicopters were used operationally.)

Notably absent was the largest cargo transport in the country, the Convair C-119G-6, now undergoing a post-war ground test program.

Operation Swearer was noticeably one of the past years' problems primarily concerned with tactical application of strategic airlift. Previous paratrooper operations involving shifts in a place in a bigger overall maneuver included the September MIKE near Honolulu and the recently concluded Operation Porters near North Hain.

• **Problem involved**—The problem set up by the Joint Chiefs of Staff is part of a continuing high level interest in logis-

tical and plans technique.

Swearer presupposed that aggressive forces had evaded in U. S. air landings made in the vicinity of Wilmington, N. C., and that they had advanced inland towards the Winston-Salem industrial zone. To repel this advance the U. S. had to establish a 15,000-man air-based air brigade (now Camp Mackall, N. C.) overrun by the enemy. Problem faced by U. S. forces was getting troops to the area with combat equipment and then continuously providing an logistical support in weapons, equipment, and food as well as evacuation for the sick and wounded.

• **Strategic Operation**—Approximately 300 transports shifted back and forth into the maneuver area delivering vital supplies. These craft were based at Greenville AFB, S. C., and Lowryburg Marine Field, N. C. Some 300 fighters, reconnaissance fighters and bomber force reinforcements as well as the transports in addition to individual interception missions. These craft were staged at Langley AFB, Va., Shaw AFB, S. C., and Cherry Point, N. C.

During the maneuver approximately 35,000 men, vehicles, equipment, were transported to the North Carolina area and completely supplied by air. Men were moved to the forward front staging points at Greenville and Lowryburg Marine bases. The first troops into the area were paratroopers delivered by C-42, C-119 and C-54 aircraft. Follow-up elements were air-lifted at airports in the area.

SAE Tussles With Jet Problems

Gas turbine propulsion tied in with transport factors bring record number of engineers to meeting.

More than 1000 engineers, airline executives and aviation craftsmen attended sessions of the second day National Aerospace Meeting and aircraft engineering display held by the Society of Automotive Engineers.

Observers anticipated that record significance for the type of SAE gathering to something relevant to air transportation problems and jet turbine propulsion. These constituted the main considerations of the convention, held in New York, Aug. 17-20.

Highlight of the meeting was the wrap-up to New York International Airport to inspect facilities in the U. S. military stable and witness a flight demonstration of Aero-Cassidy's jet liner.

• **Session Data**—Landing of the meeting, J. W. Bentley, Alcoa division stress section head, stressed that stress experience with jetliners has made possible overland jet reduction

to what approaching those of conventional engines.

Anticipated troubles with the turbo-prop were outlined by R. N. Dancy, Rockwell-Lane, Inc., in the order. These troubles and similar, namely guide vanes, turbine blades, bearings and air seals, greasing, air and oil prices, and making two engines "idle" (without production standard).

• **Tanner View**—Scott Flower of Pan American reviewed a year's operation at the Gatwick-Wright Lockheed flight number. Cost of the unit is approximately \$390,000 and operating costs vary from \$12 to \$60 per hr. One hour of actual flight costs between \$200 and \$400.

Reduction in flight time required for captain and crew who were given DeHavilland training was outlined as follows:

• **Twelve hours** from flying from Los Angeles to New York City, 1,500 mi. flying

was now required an average of 12.6 hr. per pilot at 25.1 hr. per crew. • **Twelve hours** to the Boeing 377, now 4 hr. actual flight time for the captain or 8 hr. for crew.

• **Transport FAA** officer standard for turbine training solely as aircraft is 10.5 hr.

• **Jet Transport View**—Jet airliners will have to attain productivity to be as effective to the airlines, and United Air Lines' H. E. Neume, "While jets will appear to the public because of their high speed and comfort (reduced noise and vibration), the speed, safety and safety are relatively unknown factors which will be a serious study. He estimated the potential traffic for jet transports at over 3 to 6 billion annual passenger kilometers, which would require more 50 to 100 airplanes.

• **Capitol Role**—M. D. Washburn of TWA advocated establishment of centralized airports, served by jetliners at jet planes is an essential element to rapid passenger handling. "Large aircraft engineers," such as 75-percent capacity could be used for shorthauls from these airports to business districts, latest convenience or secondary cities, while 40-percent, 550-mph. turbo-prop

could hold carry passengers between primary cities and the restricted airports.

To reduce airport congestion, Wines suggested that the majority of passenger flights be scheduled during regular daylight hours and cargo flight during the night.

Presenting the case for the turbojet, Avco Canada's W. Boyd advanced the theory that the public will gladly pay premiums for the great increase in speed and comfort the jet transport would afford. He offered the promise that the turbojet engine alone is adequate for high-speed, long-range travel, does not require the same problems to be overcome, he said, to make the gas turbine engine attractive to commercial operators as its "public threat for fuel."

Chand of French, at Eastern Air Lines asked, "Is the industry in towards the use of a separate gas turbine for auxiliary power and starting, why not use it to drive the propeller to the end of the runway and perhaps use it in land-try wheel propulsion, particularly with large aircraft."

French summarized the problems of introducing jet aircraft into commercial use as follows: Reduction of fuel consumption for the turbojet, fuel control, operating knowledge of jet engines and aircraft, and finding the capital to do it.

► **Key Aspects**—J. Dean Spens, American Airlines, commented that the numerous propeller failures experienced on Constellations, DC-6s and Boeing 377s left much to be desired in the way of prop reliability. The reliability requirement on the side DC-6 and DC-4s must be improved if the turbo-prop is to be an acceptable propulsive unit.

In rebuttal it was stated that a majority of the turbo-engine/propeller problems arise from ordinary stresses induced in the propeller by torque variations and excess power applications due to updrafts, and even whole cylinders, bring out. The turbo-prop's smooth power characteristics solve this problem. And because of troubles associated with the reciprocating engine, good safety factors have been built in to control propeller rotating stresses for turbulent applications.

► **British Citations**—C. Geoffrey Smith, M.B.E., stated that the British were so well advanced in the development of jet engines because they originally had entered their development to well-established aviation manufacturers with intimate knowledge of aviation problems and experience with power units at high speeds and altitudes. On the other hand, he observed, jet engine manufacturers in the U.S. had been given in direct by the military. He suggested experimental

realization of the most advanced British turbines are equally advanced U.S. advances.

► **Ground Problems, Control**—Import of high-speed flying upon the public will be largely lost, stated R. L. Yarnes of TWA, unless ground delays such as long trips to airports and lengthy waiting periods for baggage are streamlined.

A discussion between American Airlines and General Electric representatives highlighted jet ground operation problems.

Jets will have to be parked 100 to 150 ft apart to avoid damage during taxiing, and provisions must be made to lessen engine noise and deflect the blast upward.

J. G. Berger, FAA, and R. B. Rogers, Westinghouse, agreed that the initial overhaul period of jet engines would be on the neighborhood of 500 hours. It is acceptable to expect a 1000 hr overhaul period in 3 to 5 years, a considerable increase in flight duration over current piston engines.

► **Military View**—Major Gen. Leonard S. Kuter, USAF, discussing the transport plane as related to future military plans, cited the deficit of civil transport aircraft for military service and noted a serious shortage of transport and cargo operations within the nation.

He also voiced his personal conviction with respect to the "prototype bill" that the greatest requirement in legislation, either positive or negative, to weave the uncertainty that has existed for the past three years.

► **Weight Savings, Jet Share**—In a panel discussion devoted to the work of the Wright Brothers, John Hopkins' Francis Clauser, USAF, General Motors' Robert M. P. Baker, related developments showing that these three pioneers were "pretty much unswayed" by the Republic Aviation's Alexander Kartveli claim that the Wright brothers' rule "was the true prototype of today's plane." Opie Chisworth, USAF, presented his plan, painted on the program thinking in their engine development.

The jetliner flight demonstration, closing the meeting, was an impressive exhibit. Taken on a low-level pass over the field, there was a steep climb at about 6000 ft/min. An unusually short-radius turn was made at a sharp angle of bank. Landing roll appeared extremely short.

Finletter Sworn in As Air Secretary

As the Air Force changed secretaries last week, chances for bolstering the nation's declining air power appeared bright. By next year, the Department of Defense defense budget fishing began

a year ago [See Congressional Air Power story].

Thomas C. Finletter, New York, Air Force, was sworn in as the second Secretary of the Air Force, succeeding W. Stuart Symington, who moved east, later in the same session, to become chairman of the National Security Resources Board.

Symington gave a last warning on his final Air Force news conference that "efficiency" of the Air Force has declined in the last six months because of reduction in numbers, although its "efficiency" has increased.

While still holding to his "support" of the President's step-up Air Force "without reservation," for budgetary reasons, Symington added that he did not see how a balanced budget could be achieved with the world conditions in their present state, in which arms and other security expenditures must continue on a large scale.

He sees solution of misperceptions as the No. 1 problem of his new job.

Secretary Finletter was sworn in by Defense Secretary Louis Johnson in the presence of Maj. Finletter, the Joint Chiefs of Staff, retiring Secretary Symington and other high Defense Department officials.

Washington reports have indicated that Finletter has accepted the 45-group Air Force program, as a practical reality but he is expected to be leery on the question of the present status, which is dropping well below the 45 group level in terms of modern planes.

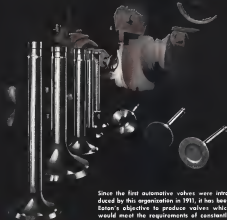
Critics at the Pentagon last week also marked the departure of Arthur S. Brown as undersecretary of the Air Force. Undersecretary Brown, Chicago business man who is involved with getting the Air Force procurement on a more businesslike operation, resigned the Air Force Employment Service moved from Secretary Symington as secretary of his successor.

His place had not yet been filled at Avonmore, West Coast manufacturers who had served with Finletter as the President's Air Policy Commission, probably would not accept the undersecretary post. McCone had previously been invited for this position.

Truman Accepts Whitney Resignation

President Truman last week accepted resignation of George W. Whitney as undersecretary of aerospace, which had been submitted under him. George Burgess, former CAA deputy administrator, has taken over his new duties as boss aided with the National Board for Reconstruction and development, in Washington.

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AERONAUTICAL ENGINEERING



AEROCENTER NC 1046, powered by a Hispano-Norm turbojet, is one of the latest French jet fighters to undergo trials. Designed for mass use, the craft somewhat resembles the Supermarine 510.

Noteworthy are the long double-vent flaps, shown extended, and the teleports on the horizontal tail. A pilot ejection seat apparently is fitted. Wings and tail are retractable.

New Foreign Planes Being Developed



SNCAN N 2200 is another new French aircraft fighter powered by a Hispano-Norm. It is credited with a top speed of 570 mph, at sea level, cruises at 530 at

15,000 ft., and has 4500 ft. climb. Service ceiling is given as 36,000 ft. Gross weight is 27,650 lb., empty weight 18,650 lb. Span is 39 ft., length 44 ft., and height is 11.6 ft.

The four military and seven civil aircraft pictured on these pages give evidence that foreign designers are very busy at getting new planes into the air in spite of the austere political and economic situation still prevalent abroad.

► **New French Types**—The French have built a large two-engine gull-wing military amphibian, the SNCAN N 1430 series weighing about 41,000 lb., with a span of 194 ft. A new biplane is the Minus-Sudair M5-472 two-place powered by a Gnome Rhone at 650 hp. Top speed is 297 at 8000 ft., gross weight is 5149 lb., empty weight is 4310 lb., and maximal range 918 mi. Fuel capacity is 115 gal. Landing gear is conventional retractable type. The air force has ordered 100.

A seven-passenger Czech-powered plane is the Boreo M1, powered by a 140 hp Walter Mlynar. Top speed is about 165 mph, range is 621 mi. Gross flying weight is 3450 lb. Tricycle retractable landing gear is used. Construction is all-metal.

SIAM-Marchetti is planning a four-engine twin tail-boom transport of similar configuration to the Fieseler NC-133. However, it is not clear whether the lower main cabin is to be detachable.

The Strickland One is an all-metal 35-place low-wing transport powered by two Pratt & Whitney engines of about 800 hp, each. Top speed is given as 360 mph. Retractable tricycle gear is fitted. The nose is noticeably by large transparent area. Big double paratrooper doors are used.



SNCAN N 1061 is powered by two Rolls-Royce Derwent 3s at 1930 hp, thrust each and is rated to have top speed of 620 mph

Gross weight is given at 14,070 lb., and wing area at 315 sq. ft. Span is 46.7 ft. Nose wheel fixed beneath the tail.

New Foreign Planes . . .



SPAIN

GVA 201 ACMEAN is a 19-12 place transport (including crew) of 25,000 lb. two 540 hp. Armstrong-Siddley Cherub engines giving the craft a top speed of 282 mph at 8,000 ft. A later version is to have Hispano Vulture four engines of 418 hp. each, giving the plane a maximum speed of 320 mph at 8,000 ft. Gross weight of the Cherub version is 11,250 lb., wings at 621 in. Span is 40 ft. 5 in., length 45 ft. 3 1/2 in., height 13 ft. Wing area is 419 sq. ft. Construction is conventional aluminum, with fuselage built in three sections. Windows, radials and skin are fabric covered.

NORWAY

FISNMARK 5A is a 12 passenger amphibian recently built by Norsk Flyindustri. Powered by two Pratt & Whitney R-3540s of 680 hp. ea., the craft is stated to have a maximum speed of 200 mph, and cruising speed of 150 mph at 60 percent power. Landing speed fully loaded is 502 mi., with nine passengers it is 215 mi. Span is 55 ft. 9 in., length 43 ft. 7 in. Service ceiling is 25,000 ft., and landing speed is 65 mph. Retractable landing gear fits into the fuselage. With gear and passengers removed, wing tip doors may be lifted for floating boat operation.



CANADA

PICKER HELICON, designed by H. B. Picker and associates of Hamilton, Ontario, is powered by a 140 hp. DMI Gipsy Major engine. It appears that the craft seats two, and the designer states that it is presently a flying test bed to study a floating in taking type of fuselage configuration. Initial tests are said to be proving the design to be sound, and the group plans to incorporate this type into, with certain modifications, as a seven engine design having increased power.



TURKEY

T-18 K-13 is an experimental single seat test bed glider constructed by the Turkish Aircraft Factory. The craft is of wood and fabric and has a wingspan of about 68 ft. with wing area of 450 sq. ft. Height is given as 6 ft. 4 in., and gross weight is stated to be 1012 lb. Skidded skids and flaps are fitted to the sharply swept wings. The T-18 K-13 is being used as a flying research model to gain data for a proposed twin engine plane to be fitted with 110 hp. G40 Gipsy Major engines. The company's factory was built in 1941 by the Turkish Air League and employs about 1200. It has built several types of light planes and gliders and also constructs aircraft and engines.



FRANCE

SNCASE SE 4000 is a 4-6 place design powered by a 450 hp. Mathis facing a three-blade retractable pitch right-left prop. Estimated top speed is given as 155 mph, cruising speed as 130 mph at 15,000 ft. Gross weight is 4100 lb., empty weight 4100 lb. Span will be 54 ft., length 37 ft., and overall height 15 ft. Wing area including ailerons is 314.05 sq. ft. Landing gear is retractable bicycle type. Range fully loaded is said to be 670 mi. Engine planned in power installation. There is a nose section door for loading of stretchers. Flaps are of split type and can be depressed 40 deg. Fuel tanks are in leading edge of wings. New undergoing tests in the



SNCAN N 2500, a new military transport with two SNCMCA 148 engines of 1600 hp. each, giving the plane a top speed of 255 mph at 9000 ft., cruising speed at 220 at 14,000 ft. Maxed range is 550 mi. Gross weight is 45,000 lb., empty weight 23,500 lb. Span is 104 ft., length 90 ft., and overall height 39 ft. Total wing area is 329 sq. ft. Fuel capacity is 440 gal. Crew is five, cargo capacity is given as 1900 lb. Six level doors on one wing is 205 ft. N 2500 bears strong resemblance to Fairchild Packet. Aileron landing gear is retractable. Rate of landing lift is easily to about 400 ft. This last is easy.

CZECHOSLOVAKIA

SOROK N11D is a three place personal plane powered by 100 hp. Walter Minor 1111, giving the craft 150 mph top speed, and 130 mph cruising speed. Fuel consumption is given as 5.57 gal. hr., and range is 650 mi. Construction is of wood, covered with plywood and fabric. Main landing gear is built straight back into the wings, the tail wheel is fixed. Landing speed is 46.6 mph (with flaps), stall rate of climb 590 ft./min. (with flaps), stall rate of climb 265 ft./min. (flaps and brakes) 155 ft./min.



ITALY

ALFAPIVA ST BALDO is a six two-place powered by a 61-hp. Walter Minor and having biplan tailboom to facilitate storage. Gross weight is 950 lb., empty weight 510 lb., and span is only 23 ft. Top speed is stated to be 117 mph, cruising 117 mph, and maximum speed 60 mph. Range at economical cruising speed is 540 mi., takeoff distance 150 ft., landing distance 180 ft. The craft is stated to climb to 3270 ft. in five minutes. A monocoque nose landing gear is fitted. Ground stability is provided by means of a skid under each wing tip. Carrying only a pilot the craft is stated to be fully aerobically. Construction is all wood.





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Range, 150 miles
Fuel economy, 9.5 gph

Beechcraft

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Joint Group Studies Noise Suppression

Industry and government are quietly working out a program to have more say in people living near engine test facilities and airports.

At a closed meeting in Los Angeles sponsored by the Air Materiel Command, defense contractors, National Advisory Committee for Aeronautics and AMCC decided to pool their resources on noise suppression and form a joint organization to conduct more suppression devices.

The LA conference gave out of a secret list of aircraft companies by Brig Gen A. H. Johnson, chief of the industrial planning division of AMCC. He found noise and engine people more worried than even about the same control problem first has been plaguing them for several years.

Discussions centered around technical aspects of design and construction of sound dampening engine cells, noise levels in the vicinity of engine test facilities of designing and building sound cells for engine runs up prior to actual takeoff.

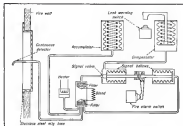
Health Hazard—Aero medical aspects of noise were discussed by Dr. Morris O. Parvitz, chief of the Bioacoustic Unit of the Army Medical Laboratory, AMCC. He pointed out that the higher velocity noises of jet engines have not increased the harmful effects in workers, but the low band of engine-propeller sounds has become much more acute.

Dr. Parvitz said protection of employees and active personnel around aircraft and of persons living near airports is the major concern of AMCC in the noise problem.

Workers can be protected somewhat by fabrication of ear muffs and other devices, he said. Protection of others is the variable that counts, about through installation of mufflers or silencers on aircraft running up high-powered engines.

Stemming Cells—Aeronautics representatives agreed protection of workers is important. But looking ahead to the days of jet transports, they pressed for improved silencing of engine cells. One manufacturer gave his reason why there's a premium need for silencing in representing engineering. "People will be coming at night to complain about our jet ships making them up. But it's just the airlines turning up at the airport."

He pointed out that with one sub-dimension concerning the airport is now in the center of the community and no longer on the outskirts of town.



UNITMAN CONTINUOUS TUBE fire detector system shown in schematic layout

Continuous Tube Fire Detector

Unit employs Cymene which vaporizes when heated and activates alarms. Price is about \$150 per zone.

A new continuous tube fire detector system, utilizing liquid and vapor in its operation, has been developed by the Unitman Corp., 250 Madison Ave., New York City. The unit acts on rapid rate of rise and fluid temperature principles, and is designed to be adaptable to locations where either low or high ambient temperatures are common.

Cost of the Unitman system is estimated at \$150 per zone, plus installation. It is being evaluated by the USAF at Wright Field and is also being used by several major airlines. The device has received CMA approval (DOD-C11) and meets specification AS-441A.

■ **Makeup**—Upon making up the detection system are: A continuous detector taking up to 10 ft. long fabricated of 0.8 in. dia. Inconel or stainless steel; a signal compensator; a system pressure compensator; signal bellows; a control panel; and two Micro Switches. Except the tubing, all units are mounted on a modular standard base and are protected from contamination by being material by means of a cap having rubber seals.

The entire system contains approximately 6 cu. in. of Cymene, a non-toxic non-hydrocarbon liquid under constant pressure by the system pressure compensator. This pressure prevents fluid stress due to altitude changes, changes the vapor pressure of the fluid and keeps it relatively stable at high ambient temperatures. It also makes possible testing of the entire system. Under normal temperature changes of

—65 F through the highest desired normal operating temperature, the ambient temperature compensator automatically prevents false alarm.

The detector portion of the apparatus is designed to respond to a minimum flow rate of one inch. Weight of the system, using a 25 ft. tube, is 25 lb.

■ **Operation**—During fire, or heat, the Cymene in the continuous detector vaporizes rapidly, and the increased volume and pressure activates the ambient temperature compensator clearing the fire alarm Micro Switch by means of a signal bellows. If the vapor pressure should become excessive due to a fire above one inch, the additional pressure will be accepted in the pressure alarm line. At the fire compartment and temperature falls the compensator will return fluid to the system, thus automatically resetting the detector should additional fire occur.

Detectors were the system was subjected to approximately 75 fires during a series of trials before it failed to function.

■ **Test**—For testing the system a switch can activate a small bellows heater to simulate a fire condition equal to approximately one-inch flame. The alarm light will show "fire" as long as the test switch is closed.

If for some reason the system should be damaged, allowing the liquid to evaporate, a system monitoring system will open the fire alarm circuit and close the warning light circuit, indicating system failure.

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"PINT-SIZE" DISTRESS RADIO

Survive in the "Globe Gird" with music radio may be this small transmitter-receiver recently developed under direction of As Mutual Commercial Development URG-4 and weighing only 6 lb.—including battery which fits in man's pocket—this radio is designed to do a better job at low weight than the 15-lb. set installed in most last planes of World War II. Device operates on VHF or UHF channels and transmits in moment both voice or code messages—compared to single distress signal put out by Globe Gird. While many feel all outdoor



men "GG" have to be touched with life or balloon, new unit has collapsible center-type antenna. You already have shown it to be capable of maintaining constant contact with as much as 50 mi. away. You can plainly understand, radio will operate after immersion in salt water and is designed to withstand temperatures from -50 to 500 F. Mercury battery power set is designed to meet deterioration from use as on age. Miller, Hoffman Radio Corp., Los Angeles, reportedly has asked FCC to license unit for airline use.

Brush Life Injection By Vapor Injection

New methods of lubricating graphite brushes used in electrical equipment, which promise to increase the life of these parts many thousands of times, have been developed by an engineer in General Electric Co. research laboratory in Schenectady, N. Y.

Noted by Robert H. Savage have revealed that graphite is not a good lubricant as itself as it was previously supposed. The solid and "slippery" material consists of layers of atoms which slide easily over each other, and it was formerly thought that this property was inherent in the graphite alone, GE says.

Savage has shown, however, that as severely thin film of moisture on the graphite is required for its lubrication. This has provided no problem where electrical equipment is used on or near the ground, since this generally is sufficient water vapor in the surrounding air to do the job.

But this does not hold true with electrical equipment used in aircraft flying at extremely high altitudes as moisture at such low temperatures that water vapor is almost completely absent, according to GE.

Vacuum methods of treating brushes

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An Important Announcement Concerning The BARTOW LIGHTING SYSTEM for Airport runways and landing systems by THE WELSBACK CORPORATION

THE BARTOW SYSTEM

The Bartow Lighting System for airport runways and landing systems, making possible the landing and take-off of aircraft under a wide range of visibility conditions, was developed and patented by John E. Bartow, the pioneer in this field. It permits the use of higher runway power without glare and halos, thus giving to the pilot increased cockpit visibility of the runway ahead in perspective. The system is patented under U. S. Letters Patent No. 2,315,256 and has been approved by the Civil Aeronautics Administration. The system includes a series of light units following the runway, centrally spaced at intervals of from 100 ft. to 300 ft., depending on the type of unit and the visibility conditions being prepared for. The center power distribution of the light unit has a relative high center-to-center beam towards the glide path with a lower intensity distribution of gradually decreasing intensity in order to illuminate the light in such a way that the light reaching the eye of the pilot, from all the lights that may be visible in line at any time, is substantially the same as he approaches the runway for landing.

The System has been in use since 1939. During the war it passed its worth test in such places of extreme weather conditions as New Zealand, the Aleutians and other locations where the second fastest installed more than 70,000 high intensity units.

The System has been a major factor in increasing the dissimilarity between Bartow units, and it is today installed on many of the principal airports of the world, and many systems are being installed each month. It has the undoubted endorsement of airline pilots, engineers and aeronautical experts everywhere.

See Systems of three types, (1) High Intensity, (2) Medium Intensity, and (3) Low Intensity, extremely differing only as to intensity of the light in each varying needs.

The High Intensity System uses a light of maximum candle power of 70,000 and some units are capable of producing more than 100,000 candle power. It is designed primarily for low visibility conditions. The System permits landings to be made under current best weather conditions both day and night and will keep your air current open and available for your landings during many hours when a would otherwise be closed because of weather conditions. For example, on a cloudy landing has been limited to best made on fog conditions when airport visibility was less than 1/2 mile using a high intensity light system in conjunction with ILS and approach lighting.

The various extent of the high intensity lighting system is to be installed should depend on the varying visibility conditions to be prepared for. There are principally two methods of varying the brightness of the light in comparison for varying visibility conditions. First, by setting the height of the lamp filament, second, by adjustment of reflecting the light in some part of the beam in relation to side glide path. The combination of these methods permits the use of higher candle power lights as it can be adjusted and reflected at the most suitable combination, thus permitting more efficient operation, giving the pilot maximum cockpit visibility, during a greater variation of visibility conditions without glare halos. Some successfully available light units are equipped for both methods of control. Both methods are instantly changed from the second.

The Medium Intensity System is less expensive to install and is less often used during low visibility conditions. It is primarily designed for situations where visibility conditions are generally above some limit (usually half mile) and uses lights which produce a maximum of 15,000 candle power. It has been used for landings in moderately bad weather such as rain and light snow.

The Low Intensity System is often not only at night on situations where

visibility conditions are generally good and uses lights which produce a maximum of 1,500 candle power.

Responsibility of the Airport

The first responsibility of every airport operator is to provide safe, dependable service for the community, the traveling public, the commercial airlines and other firms.

Clouds and Rain

Clouds, rain, fog, and other weather conditions are the most common cause of airport delays and cancellations. These delays are caused by the fact that the weather is so variable and so unpredictable that it is impossible to predict the weather with any degree of accuracy. The only way to avoid these delays and cancellations is to have a system of lights that will provide a safe landing in all weather conditions.

A High Intensity Lighting System Will Keep Your Airport Open

The installation of a High Intensity Lighting System at your airport is a "must" from the standpoint of safety. It will eliminate more than 50 per cent of the losses caused by cancellations and delays due to visibility conditions.

Extensive instrument landing systems are highly expensive to keep in service to a position from which a landing can be made, but to have the light in only from the last 100 feet of clouds in bad weather or at night requires visual reference to the ground.

No electronic instrument landing system yet developed gives the pilot the instantaneous reality which he needs when visually seeing the light which is the ground and the light which is the runway. The only way to avoid these delays and cancellations is to have a system of lights that will provide a safe landing in all weather conditions.

The Welsbach System

This reputation has been in the Lighting Engineering field for over 20 years but it was a considerable or delay in the equipment comprising this system. It is the earliest known under the Bartow system and is the principal instrument in connection with airport lighting. It is the earliest known under the Bartow system and is the principal instrument in connection with airport lighting. It is the earliest known under the Bartow system and is the principal instrument in connection with airport lighting.

The Welsbach Corporation retains exclusive use of the service of Mr. Bartow and of the staff of his company, Bartow, Bartow, Inc. These units are available for consultation in the layout and design and to represent consultation and adjustment of the system to the needs of the airport.

We also are prepared to offer plans for maintenance and repair of the system after it is installed.

Manufacturers and Distributors of Equipment for the System

Principal manufacturers and distributors of the equipment parts of the System are:

Crown-Hill Company, Syracuse, N. Y.
General Electric Company, Schenectady, N. Y.
Laird Manufacturing Company, Brookline, Mass.
Revere Electric and Manufacturing Company, Chicago, Ill.
Wetzelbach Electric Corporation, Pittsburgh, Pa.

These manufacturers furnish catalogs describing their equipment and have inventory representatives available for consultation on cost and technical details.

Technical Information

Complete technical information can be obtained from our representatives who will call on you at your request and from the Lighting Division of the Civil Aeronautics Authority. This year's new, more extensive information is from the manufacturers and distributors listed herein.

Patents

All runway lighting systems and the lighting system using the principles described herein are patented under U. S. Letters Patent No. 2,315,256 issued in John E. Bartow April 16, 1939. The Welsbach Corporation has the exclusive right under this patent

in great interest for consultation and use of these systems.

Low and Medium Intensity Systems

Bartholomew lights are grouped by The Welsbach Corporation into three types: a low and medium intensity system. Any system is a low or medium intensity system when its light is the system, including threshold lights, is capable of emitting without color correction a light in excess of 10,000 candle power. Threshold lights are a series of lights in either end of the runway in a line perpendicular to the axis of the runway.

High Intensity Systems

Any system containing a light, other than threshold lights, capable of emitting without color correction a light in excess of 10,000 candle power is a high intensity system, and a license must be obtained and a revocable order of installation and use of the system must be obtained from the Civil Aeronautics Authority.

License Fee

The system for use for consultation and use of high intensity systems on any airport in the United States and on possessions in territory (1937) are not running, first of runway, measured from the position of the last light of the System to the last light of the System.

Standard License

Standard form of license is available without charge from The Welsbach Corporation, upon request.

How to Obtain a License

A standard license can be obtained by the airport owner, operator or lease, or by the contractor installing the System.

A license is the certificate which authorizes the use of the light in the system when installed, and the airport owner is a prime factor in the system.

Application by Airport

When the airport authorities desire to obtain a license directly, application should be made on forms provided by the corporation. A simple application form is available upon request.

Application should be made at least two weeks before application for the System are referred to the Bureau.

Application by Contractor

When application is made by the contractor, a license for the system and use of the System and that part of the license fee is not paid separately or included in the installation fee. A standard form of application for license by a contractor will be provided by The Welsbach Corporation.

Bidding Instructions and Contract Provisions

For your convenience, suggested forms for bidding instructions and contract provisions and related documents are available. They will be sent promptly to interested parties by The Welsbach Corporation.

THE WELSBACK CORPORATION

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...are made to latest NAS Specifications. Bolts are fully formed by rolling after heat treatment, an important UNBRAKO feature. Full range of standard sizes.

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...incorporate the famous FLEXLOC self-locking principle and one piece, all metal construction. The exceptional reliability of this construction has been proved by the utilization of FLEXLOCs used in the aircraft industry.

- Other outstanding advantages include:
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- Send for samples and information.



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Write for further information on these UNBRAKO and FLEXLOC Products.

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JENKINTOWN 28, PENNSYLVANIA

chemically to polish their lines for more finish, but further improvement is needed, the firm states.

Savage's approach to this problem has been to develop a means of shielding those parts of the electrical equipment where oxidation can build and applying water vapor to the space created there.

In tests he has shown that brushes which oxidized would have worn out in an hour without water vapor, will last from 2000-5000 hr. with his development.

These findings are enhanced by the fact that certain organic vapors are up to 1000 times as effective than water, so that only very small concentrations could be used to provide lubrication.

Further developments are being tried and not to apply Savage's findings to other areas "where the wide range of operating conditions require more trials than this have to be solved." The general aspects of equipment with shielded parts are undergoing evaluation in comparison with equipment using chemically treated brushes," the firm states.

Computer Refinement

A new development which brings the computer closer to depicting the true form of the fuselage has been announced by the Bell Telephone Laboratories, New York.

A new line has been found by a Bell scientist to enable a computer not only to detect the error involved, but to correct them.

According to Bell, this is "one of the most important and fundamental advances in computer techniques since the development of digital powered an additive tools." It is expected this development also will be significant in the communications field where transmitters are on a code basis.

The basic concepts underlying the technique are the direct result of past mathematical research carried out by Dr. B. W. Hanning, Bell Laboratories mathematician. Equipment representing a working application of these mathematical concepts already has been built by Bell, but has not as yet been embodied in a complete computer. Bell says similar apparatus could be easily fitted into future calculating machines.

This development is considered to be particularly valuable in the case where engineers find in a problem and have it up to the computer to solve it overnight or even over a weekend. Now when the computer makes a mistake it will record that fact, including the approximate location, and then go on to correct the error.

The laboratory model has been designed to correct one mistake at a time and to catch—but not correct—two

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First of its kind ever designed... the ROHR-built test stand for testing exhaust systems. Constructed to test the exhaust system of the B-36 Super Bomber, it simulates temperature, pressure, vibration and other conditions experienced at altitudes above 40 thousand feet.

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malfunction errors. Although it can
be done, Hines does not believe it is
economically feasible to design the
cable to correct simultaneous errors since
the chance of two breakdowns occur-
ring at once is extremely small.

The new method can be applied to
any digital computer, either electronic
or relay type, according to Hild.

New Hydraulic Fluid

A improved type hydraulic fluid and
a new synthetic grease for aircraft are
have been developed for the Navy's Bu-
reau of Aeronautics.

The hydraulic fluid—Hydrolube N-1—
is an improvement over the earlier
Hydrolube Oil and uses only five in-
stead of nine ingredients. The hydro-
lube fluid is basically a mixture of ethy-
lene glycol and water to which have
been added substances to check cor-
rosion, lubricate in vacuum viscosity,
and lubricating agents. Other improve-
ments in the new hydrolube include
the development of better materials
added to the original mixture and the
combination of features in the added
materials.

The hydrolube fluid is non-fluor-
mable and are specially designed to
eliminate fire hazards caused by contact
damage to hydraulic lines.

The new synthetic grease was origi-
nally developed by the Naval Research
Laboratory for BuAer and has since
been improved and perfected chemi-
cally. It has been in test service on
Navy and Air Force planes for over two
years.

The two new lubricants are signifi-
cant, according to Rear Admiral Alfred
M. Fiske, chief a BuAer, because they
use only chemicals produced in the
United States and can be used on a
wide variety of equipment from large
cabiner jets to all parts of aircraft.

British Planes Filmed

"British Aircraft Review-1949," motion
picture made by Shell Oil Co. Ltd.,
shows the parade of planes at the Sher-
city of British Aircraft Corporation's
show at Farnborough, last September.
Highlight of the film is the very steep
climb exhibited by the new Canberra
jet bomber, and the very tight perform-
ance of Britain's jet craft.

Featuring aerial and ground photo-
graphs, the film shows interesting flight shots
of these and other crafts—Westland Wyvern
(first combat turboprop), Hercules
V, Vincent, Canberra, Comet, Hawker,
four jet fighters, jet fighters, Venom,
night fighter version of Vampire, and
Dove with reverse props.

The 16mm film runs for about 20
min. and is available for showing, free
of charge, from Shell Oil Co., 90 West
5th St., New York 20, N. Y.

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SALES & SERVICE

Luscombe Back

TEMCO's H. L. Howard
heads re-organized firm.
Early deliveries seen.

A newly re-organized Luscombe Airplane Corp. is getting set to make a comeback in the light-plane field with the aid of Temco Engineering and Manufacturing Corp., Dallas, Tex.

Under a plan actually proposed by Temco last December, new management will be headed by H. L. Howard, executive vice president treasurer of Temco. He was elected president and chairman of Luscombe. Other directors are D. Harold Byrd and Robert McCulloch of Temco's board.

►**Production Flow**—Production is to be started as soon as possible at Luscombe's Garland, Tex. plant, and will include manufacture of fuselage pieces for domestic and foreign use, approval of craft, and spare parts for the 6000 Series now in use.

A refined version of the T-39C, Observer has been selected as the USAF liaison plane competition at Wright Field. Several foreign countries for this model are now being negotiated. Also slated for aerial is the two-place Scouter, an improved 500-hp. Silvera De-Luxe, and a stripped Economy 30-hp. for which events and sponsors will rapidly pour funds. The company hopes to begin deliveries of the latter two types in late June or early July of the year.

►**Inventory Setup**—Many of the former Luscombe distributors are being notified. Howard emphasized that a full line of Luscombe manufactured parts is now available, and spares can be obtained through those former Luscombe dealers or by contacting the company's home office in Dallas.

Hicksville Club Seeks New Quarters

The famed Aviation Country Club, Hicksville, L.I., N. Y., is looking for a new home. The club closed down its operations in the late May 31. A housing development consisting of over 10,000 people houses had gradually encroached the approximately 87-acre former polo field and completely destroyed the competitive isolation enjoyed by the club since its founding June, 1929. So the members recently

voted to sell the site to the housing enterprise.

The flying service operated at the field by Mel Skotnicki is also seeking new quarters. The single hangar, which used to hold about 25 planes, has been torn down and the field is planned up. Members have scattered to various nearby airports, the nearest now being Hicksville at Roosevelt Field, L.I.

The club's board of governors has conducted a questionnaire among members to aid in determining the club's future and selection of a new site. A new location, further out on Long Island is under consideration.

►**History**—The club was founded by a group of sportsmen pilots under the guidance of Jack Reiser and skates members included Conner Lanning, George Bailey, Charles Lawrence, Len De Flores, Ed R. McDonald, Charles Vought, Wilkins C. Leeds, Roland Palmsdale, James R. Taylor, Jr., "Pete" Brooks, and C. V. "Jack" Whitney. The club had an active list of about 200 members and achieved a record of only one injury due to flying during its stay at Hicksville.

An outstanding youth function was a demonstration air meet each spring, when manufacturers displayed their newest models to audiences numbering about 600-750 members and guests.

Harrington Crash Findings Reported

Good Aeromarine found has released the report of investigation into the fatal EC-3 crash of Harrington's, Inc., last November, which took the life of pilot J. R. "Bud" Harrington, former member of the three-man National Aviation Trades Assn. Advisory Committee in 1947-49, and two other crew members. The plane, a Cessna 441, crashed 3200 ft. south and 850 ft. east of runway 18 during an ILS approach to Alcoa-Canton Airport, Alaska, Ohio.

The Board determined that the probable cause of the accident was improper execution of an instrument approach, which resulted in the aircraft being flown in the right of the proper approach path at an altitude too low to clear the terrain. The plane's initial report was from the pilot's report of an altitude of about 70 ft.

Findings state that there was no evidence of mechanical malfunctioning and airplane and ground radio facilities and ILS were reported to be functioning normally.

Harrington's, Inc., was an irregular carrier located at Cleveland, and had a large irregular carrier certificate. Harrington had an annual's certificate with annual irregular pilot's ratings, and had logged about 5000 hr, including approximately 600 hr. multi-engine time, and 275 hr. instrument time.

BRIEFING FOR DEALERS AND DISTRIBUTORS

►**FOR THE SHOW-CASE**—A new type of Polaris sun glasses featuring variable lenses to combat light dispersion and that vary glass intensity in an area of interest for expert drivers. Front lenses of glasses are fixed and rear lenses may be rotated by means of a tab through 90 deg., permitting infinite variable from full brightness to practically full dark, claims manufacturer, Pioneer Scientific Corp., 295 La Fayette St., New York 17, N. Y. Prices to dealers are \$5 per pair in lots of one to five and \$7.90 in lots of six or more. A low cost dealer demonstrator is given with each order of one. Glasses retail at \$17.50 per pair.

►**BULLET TRANSFER**—Aircraft Manufacturing Co., Tyler, Tex., under of Johnson Bullet (Aviation Week Feb 27) under license, has assigned all type certificate data on the craft and plans to continue producing it under the name Texas Bullet 207. The Bullet is a four place all metal low wing plane powered by a 185-hp. Continental. Company's offices are W. E. Stewart, president, A. S. Gervino, vice, S. J. Taylor, secretary treasurer, and Sam Gibson, and secretary treasurer.

►**REVENUE TIP**—Local papers and radio stations are good outdoor bets that the start local time operator doesn't overlook. Witness the case of Hunter Flying Service, Cedar Rapids, Iowa, which has leased a Bush Bomber to the Cedar Rapids Gazette and Station KCRG to enable their staffs to get local news and pictures, and also to cover winter training of baseball teams in Florida.

►**"ANTIQUES"** SOUGHT—Manufacturers Aeromarine Corporation is trying to locate some early slide-in airplanes to be used in a static display during Boeing's airport plaza day program of that city's modern center public. If you have such a plane and want to enter it, contact the chairman at Logan International Airport, Boston. The deadline is set for May 18.

►**JAMISON DISTRIBUTOR** NAMED—Avco-Aerco, Mass. has been appointed New England distributor for new three-place Jamison Jupiter all metal personal plane now undergoing CAA tests.

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Auto-Lite Low Tension Cable shielded Specification ANE EC-12

HIGH TENSION

Auto-Lite High Tension Spark Plug Cable Specification ANE EC-13

Auto-Lite High Tension Spark Plug Cable Specification ANE EC-14

Auto-Lite High Tension Spark Plug Cable Specification ANE EC-15

Auto-Lite High Tension Spark Plug Cable Specification ANE EC-16

FINANCIAL

Aviation Profits Below Average

Survey shows both manufacturers and airlines post lower returns on income than is normal for their groups.

The profitability of the aviation group can once again be viewed, as proper perspective against the earnings experience of general industrial enterprises. Only the City Bank of New York in its current monthly letter discusses its comprehensive compilation of 1949 net income covering a total of 1122 of the leading corporations engaged in manufacturing and commercial activity.

The survey shows that a total of 27 aircraft and parts companies reported net income after taxes of \$50,870,000 for 1949 compared with only \$17,727,000 for 1948. This would indicate an improvement of more than 185 percent in earnings. As a contrast, all 1710 manufacturing companies covered merited a net income of \$6990 million for 1949, down some 14 percent from 1948. Clearly, the aircraft industry's gain in net profitability was the greatest revealed by any industrial category in the National City Bank study.

Not Too Pessimistic? This increase may seem only one year's gain, however, can be very misleading. As previously indicated (Aircraft Week, Apr. 24), the aircraft industry is essentially a contracting business and, as such, does not lend itself to an exact accounting by means of yearly periods.

Consistent earnings is not one of the aircraft industry's main traits. Examining post-National City Bank earnings data, it is revealed that in 1947 every industrial manufacturing group, excepting aircraft, recorded a high rate of earnings. For that year, 25 aircraft and parts companies came up with a gain based not on sales, after tax adjustments, of \$55,230,000.

During 1948, the peak of postwar industrial profits, the aircraft group's performance was mediocre.

Always missing, though rarely acknowledged, are the qualifications peculiar to frequent tax adjustments, price adjustments and negotiations and other special factors. For a more correct appraisal of results in the aircraft group, it is essential to examine trends extending over a period of years.

Low Profit Margin? Of real significance in any industrial manufacturing operation, is the profit margin related to sales. For 1949, the National City Bank groupings of aircraft and parts companies showed a net profit margin of 3.3 percent on sales. This compared

with only 1.4 percent for 1948 and a negative 4.0 percent for 1947.

This showing by the aircraft industry, in a period which represents the best years in the real life of the war, is particularly noteworthy in the light of profit trends here reported. The chief financial officer of one of the largest aircraft companies publicly stated some months ago that the industry stresses more its demand to permit the industry to earn about 10 percent before taxes, on government contracts, at about 6.2 percent after taxes. It is obvious that the 1949 average falls far short of this measure and highlights the fact that military contracts do not always return the profits commonly expected.

It is noteworthy that all 1710 industrial companies in the National City Bank survey showed an average profit margin of 6.8 percent for 1949 and 7.5 percent for 1948. This clearly demonstrates the average rate of profitability of the aircraft group was far less than that of the industry generally during 1949 and about matches the overall industry experience of 1948.

Of all the major industrial groups, only meat packing showed a lower profit margin than the aircraft for 1949 and 1948 with an average percentage of 0.5 and 0.7 percent, respectively. Traditionally, meat packing always has had a low profit margin because of the high volume of business handled.

Even industry equipment builders who also have major cyclical manufacturing means, have consistently reported the aircraft manufacturer in the postwar period. During 1949, they showed a profit margin of 4.4 percent against 5.4 percent for 1948 and 5.1 percent in 1947. Shipbuilding, another activity of a major contracting nature, also suffers the aircraft industry in the rate of profitability. For 1949, this specialized group showed a profit margin of 5.0 percent, slightly below the 5.8 percent reported for 1948 and below the 3.2 percent shown for 1947.

Profit in Investment? In respect to the percentage return on invested net assets, the aircraft industry has done better but continues to fall short of the overall manufacturing average.

For 1949, the National City Bank survey discloses that the aircraft group sustained a return of 8.6 percent on net assets compared with only 2.9 percent

for 1948 and a negative 6 percent for 1947. In viewing this showing, what the survey suggests is reveal is the effect on earnings played by the extensive facilities used in aircraft manufacturing, but which are owned by the government and leased to the operating bodies. In other words, the leverage of these leased properties should increase the rate of profitability for the core assets involved.

The average for all manufacturing enterprises during 1949 was a 13.5 percent return on net assets compared with 18.2 percent for 1948 and 10.4 percent for 1947. Again, the average percentage return on net assets as reported by the industry builders and distributors group was higher than the aircraft for the three year period examined.

Aircraft Profits—A number of interesting notes are also disclosed in the National City Bank study on air transport profitability. This summary shows 15 air transport companies reporting net income of \$17,279,000 for 1949 as contrasted with a deficit of \$171,684 for 1948 and a statement loss of \$17,093,000 for 1947 air transport carriers in 1947.

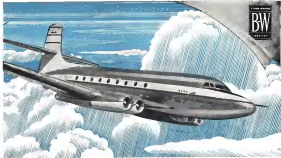
For 1949, the air transport group revealed a profit margin of 1.3 percent, a definite improvement over the negative 0.3 percent of 1948 as well as the negative 5.0 percent for 1947. By contrast, even the railroads were able to do better. For 1949, the roads demonstrated profit margins of 5.1 percent for 1949, 7.5 percent for 1948 and 3.5 percent for 1947. The tractors and bus group, however, appear to be losing ground on this basis to the other transportation mediums. For example, for 1947 their profit margin was 4.5 percent, declining to 4.2 percent for 1948 and to 3.2 percent for 1949.

On percentage return on net assets, the air transport group led all transportation categories for 1949, with 6.5 percent others. All transportation companies averaged but a 3.3 percent return on net assets for 1949. However, while the air transport group showed a positive return on net assets for 1949 and 1947, all other transportation mediums revealed a tangible return ranging from 1.4 percent for tractors and bus to 14.9 percent for shipping.

Important qualifications must also be attached to the reading of the ratios for the air transport group. For one thing, intensive mail pay awards and temporary mail rates have an important effect upon airline earnings from year to year.

Moreover, the airline group is one of many industries. The averaging of industry ratios, lumping together, domestic trunk lines and international systems in the groupings tend to obscure the true picture of the individual carriers taken separately.

—Selig Altschul



IT'S PESCO ON THE AVRO JETLINER North America's first jet passenger plane

Designed to cruise at 450 m.p.h. at 30,000 feet, the new Avro Jetliner of A. W. Roe Canada Limited promises to be one of the swiftest, quietest passenger aircraft ever to fly the skies.

The four Dwyer jet engines, mounted in pairs, and each rated at 3500 the static thrust at sea level, can push that huge, 90-ton, 50-passenger plane up into the air at a climb rate of 3,000 feet a minute... faster than World War II fighters!

It takes fuel, and lots of it, to deliver this kind of power, and four Pesco fuel booster pumps, one for each engine, make certain that no engine ever goes hungry for an full share of kerosene. Pesco vacuum pumps and a Pesco oil separator are other Pesco parts in this latest exciting passenger plane.

Four auto-pressurized and controlled flow of fuel brought greater safety, automatic operation and engine-to-control to aircraft. Pesco skills and craftsmanship.

They have been providing the precision-made fuel and hydraulic pumps and controls that are now standard equipment on all types and makes of planes. It is experience and know-how that can help you.

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3. Pressure Relief Valves
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6. Engine-Driven Hydraulic Pump Systems
7. Electric Motor-Driven Hydraulic Pumps
8. Electric Motor-Driven Hydraulic Pumps
9. Motor-Driven Hydraulic Booster Pumps
10. Hydraulic Power Actuators
11. Hydraulic Pressure Reducing Valves
12. Hydraulic Pressure Relief Valves



BORG-WARNER CORPORATION
24700 NORTH MILES ROAD BEDFORD, OHIO

NEW AVIATION PRODUCTS

How New Lubricant Fares in Tests

	Liqui-Moly	Liqui-Moly and oil	Oil only
Test temperature during run (average °C)	118	127	No "test,"—lubricant ran out to failure
Time required to reach peak temperature (min)	38	33	37
Time to failure	(Predicted) estimated, longest test 30 hours		23 min
Stabilization temp. (°C)	77	88	Oil reduction in temp. after run; 102.2 deg. failure temp. (oil at 325°)
Drops per minute (oil in trap) to peak (oil in trap during 1st hour and end of run 4 hr)	3.5	3.1	
Proximal drag on nut apparatus (lb) x 100	1.2	3.4	4.6
	150	150	650

TEST RUN of Liqui-Moly was accomplished with two test loads 1 in. in diameter, one first, the other rotating against it at 75 psi pressure and 1500 rpm, 1000.

Metal-Base Permanent Lubricant

Colloidal solution of molybdenum, for use alone or as additive, resists high temperatures and pressures.

A new use of the widely known lubrication properties of molybdenum potentially promises to reform lubrication techniques. Tests up to now indicate it might be a permanent lubricant, noncorrosive and resistant to high temperatures, high pressures and positively all common chemicals.

The new product, a colloidal solution with a molybdenum base, now is being marketed by Lockery Co., College Point, N. Y., under the name of Liqui-Moly. According to A. J. Lockery, its developer, it can be added to circulating oil systems to improve lubrication. Or, it can be used where cooling effect of a circulating system is not required. Liqui-Moly can replace oil, or, it can be sprayed out by any amount of pressure, thus protecting bearings against scoring or scoring even after all the oil has been burned out.

► Permanent Film—Lockery says that his product forms a permanent film—resisting film—when contact is exposed out by any amount of pressure, thus protecting bearings against scoring or scoring even after all the oil has been burned out.

► Aerosol Waxes about Liqui-Moly that react as aircraft engine would continue to operate even after the oil system failed if Liqui-Moly had previously been added to the oil, his answer: "Although we have never made a test on a complete engine, our tests on a smaller scale would indicate that an aircraft engine should operate at least longer than usual after loss of oil."

► Kerps Temperature Down—"Actual tests have shown that friction surfaces

running at high speed under heavy pressure will heat up more than 100 percent faster with ordinary lubricating oil than when running dry with only Liqui-Moly, and moreover that the temperature rise with oil is continuous until failure and occurs, whereas with Liqui-Moly, it reaches a stabilization point and then usually recedes."

Lockery says tests made by the Flight Propulsion Research Laboratory of the National Advisory Committee for Aeronautics show effective lubrication by molybdenum oil at pressures as high as 225,000 psi and at speeds as high as 8500 surface ft/min.

Other tests show lubricity unaffected by working temperatures as high as 750 F or by vacuum conditions. Under certain conditions it is said to be effective up to 1000 F and it will test well with steel at temperatures as high as 1500 F.

► Certain Tests—First tested in Liqui-Moly shown by the aviation industry in the Propeller division of the Curtiss Wright Corp. at Caldwell, N. J., where the product is being tested on a "rotational rig."

Liqui-Moly in its present state could not be used to quill oil heat as a circulating system because the solution in which the molybdenum is suspended evaporates. Although in its "dry state" it will "maintain sufficient lubrication, oil or some other circulating medium obviously is needed to carry off heat generated by combustion and other sources."

► Another Version—But the company says "instead, non-volatile form of Liqui-Moly will shortly be offered, with a high viscosity index, for applications where the coolant effect of a body of circulating fluid is desirable."

The product, the firm adds, "above all other light weight oils (from -40 to 500 F), does not carbonize or break down with age, and probably cannot as close as possible to the ideal of permanent lubricant."

► Auto Use—Lockery gives this example to point up the efficiency of Liqui-Moly as a lubricant: "One of the engines at the race in Colorado which got out at 118,000 rpm without a gear job. And his oil consumption is still only 4 qt. per 1000 mi. He adds 4 qt. of Liqui-Moly to his oil every 1000 mi."

The product comes in three types: **► Liqui-Moly Regular**—about the consistency of No. 20 SAE motor oil, for use where relatively thin liquid is required.

► Liqui-Moly Grease—for use alone or with grease in grease guns.

► Liqui-Moly Concentrate—for use as an oil additive, containing about four times as much molybdenum as "Regular." Prices range from \$3-56 a pint (More New Products News on p. 43).

Model No. 8288

FLOW: 0.000 GPM

OPERATING PRESSURE: 50 PSI

OPERATION TIME: ONE SECOND

Model No. 8290

FLOW: 0.000 GPM

OPERATING PRESSURE: 50 PSI

OPERATION TIME: ONE SECOND

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World Leader in JETS

The Lockheed Aircraft Corporation is the largest producer of jet aircraft in the world.

Lockheed's five year continuous production of practical jet airplanes almost equals the total output of all other U.S. manufacturers combined.

The world's first mass producer of jets, Lockheed established this leadership with the P-80 Shooting Star, America's first operational jet airplane. This fighter, like other Lockheed jets (the T-33 two-place jet trainer and the new F-104 intercepter), is noted for its speed, maneuverability and strength.

Carrying on this tradition is the newest member of the Lockheed jet family, the rugged, two-engine F-100 jet fighter. It is now undergoing evaluation tests by the U.S. Air Force.

This broad experience in the development of practical jet aircraft is invaluable in the Lockheed laboratories where the designs of the future are taking shape today.

LOCKHEED

Aircraft Corporation, Burbank, California

Look to Lockheed for Leadership

Voltage Regulator

Type AVR-89 carbon pile voltage regulator, offered by Westinghouse Electric Corp., Pittsburgh, Pa., is designed to maintain constant voltage output from 300, 450, 500 to 480 amp. alternator generator over its range of speed and load. Unit weighs 2.75 lb. and conforms to specification AN-8-1a.

Regulator has carbon stack resistance of 1.25 to 35 ohms and is rated at 90 watts. It will carry an overload current of 15 amp. through the carbon stack for 1 hour, and it maintains equal load division when two or more generators and regulators are operated in parallel. Regulator actuates force is induced by use of a steel cantilever spring which bears on a polished surface. Milled bronze transfer holds carbon wheel and reduces heat transfer from stack to spring. A copper cap and flat steel shield provide an air pocket as well as spring damping. Regulator life is said to be extended up to 500%. Carbon dust has small outside diameter, but are thick enough to permit tapping smooth and parallel to within .0004 in. Integral dust bearing and sealed bearings reduce weight and effects of vibration and centrifugation on controlled voltage. A ring of temperature compensator steel alloy magnetically compensates for changes in ambient temperature from -55 to 75 C.

The new Shell track has greater maneuverability, despite large tank assembly, through the use of two rollers instead of the usual three or four. Another important feature on this track is the pilot valve system. This system is part of the valving equipment and it provides action to collapse the hose when not in use to speed handling and reduce working time. The 15 in. hose permits avoidance of gasline from the plane's tanks when required.



'Wet Water' Capsules

A development which makes water more effective as a fire fighting agent is being marketed by Aquadyn Corp., 123 E. 43 St., New York 17, N. Y.

It is a capsule, designed to be mixed with water, called Pyradyn. This product is a solid composition weighing 3 lb. and containing highly concentrated active blends of wetting elements.

One capsule produces more than 1800 gal. of multiphase "wet water" by reducing surface tension of ordinary water to an extent from about 72 dynes to 18 dynes. Cost of this product varies to 64 mil/gal. Aquadyn says that is 1/4 the cost now prevailing.

Pyradyn treated water will put out drop armed fires quickly and completely with approximately 1/4 the amount of water usually required, the firm states. It "penetrates deeper, diffuses faster, wets to the root of the fire and cools quicker than any other fire fighting product, thus virtually no waste (spill)." In the aircraft industry, it would be especially suitable for use in plants and warehouses.

According to the firm, 80 percent of plane water based on a fire is ineffective. It men old to water with its best absorbing capacity unused.

To permit effective use of Pyradyn capsules, company has developed two capsule capacity Hydrocollender units which can be hooked into water source and stand ready to deliver more than 2000 gal. of Pyradyn solution before frames must add new capsules. Capsules can be replaced in a fraction of a minute. Also Summa Hydrocollender installations with bypass valves are designed to deliver an amount of treated water without interruption.



High-Speed Fueler

Improved aircraft refueling tracks with greatly increased pumping capacity and higher maneuverability are being tested by Shell Oil Co., 50 West 50 St., New York 20, N. Y.

Some of these tracks already are receiving consultations operated by Eastern Air Lines, in Charlottesville, N. C. More are being built for use in other parts of the country.

Highlight of this track is two independent hose system, each capable of delivering more than 200 gpm. While there already are some other 200 gpm tracks in operation, most still have a fixed delivery rate requiring operators from 75-115 gpm. Some units rated for 75 gpm actually drop down to a delivery rate of about 55 gpm, an operator relaying expert says.



AIR TRANSPORT



PERCUTAN. PRINCE, one of nine bought by Shell Oil Co., two of which have just passed through the U. S. on their way to Venezuela.



British Feeder Transport Aimed At U. S. Market

AT WASHINGTON AIRPORT, the Prince shows its special features, including dual wheels, streamlined openings, good passenger visibility due to highway arrangement, small frontal area of Alfa Romeo engines.



NOSEDOWN is examined by Sydney Nesbitt, Atlanta Aviation president; Ben Brown, Federal sales manager; Christopher Clarkson, and Eric MacKeld, British Aerospace.



CONVERTIBLE DOOR is demonstrated by Brown to Nobility. Center panel, which Brown is removing, and door at left make conventional passenger opening. Removal of roof doubles deck size for cargo loading.

Nesbitt to Sell Prince in U. S.

Veteran aircraft salesman hopes to build field here for B-12 messenger British feederline.

single engine takeoff to clear 50 ft obstacle at sea level, 1218 yd, with one engine inoperative 12,000 ft, service ceiling 23,400 ft, stall speed with flaps and underslung, 74 mph, fuel consumption both engines, normal cruising cruise speed 38 mph (2).

► Middle-Class-Like Brown. Pervez, sales manager, who accompanied the Shell Festival on the visit to Washington pointed out that the Hitech plant fits in size somewhere between the Boeing 18 and the Douglas DC-3 among American transports.

Cabin has 6 ft head room, and requires a single short step up from the ground in order to enter. Plant has been designed for quick maintenance access, ability to segment, and to radio and instruments, through a rear door.

Salaries of Feeder Executives Listed

Salaries of feeder sideline executives in 1949 showed relatively little change over 1948, and for the most part remained considerably below payments to

Highest-paid freedoms executive last year was Trans-Trans Airways President R. E. McKinnon, who received \$22,456, compared with \$25,000 in 1946. Ranked up were All American Airways

President Robert Lowe, who was paid \$15,000 in both 1997 and 1998, and C. M. Becke, whose salary as president of Los Angeles Airways helicopter mail carrier rose from \$12,787 in 1990 to

Other 1949 salaries, with 1948 comparisons in parentheses where available, were:

[illegible]

Over 3 persons shareholders: Edmund Dominick, 31 second, Wesley Gordon, 45

Over 1 percent of the population of the United States is of Japanese ancestry, according to a report by the U.S. Census Bureau.

In England—Joe Lee, president, says (1961):
T. B. Hutchinson, ex. dir., Arris Sales, says (1961): 1970, 100%.

Over 3 percent ownholders Joe Kassekowske holds 23 percent Joe has 4 percent. Wagner & Robinson, Lexington, Mo., 30 percent preferred and 14 percent common.

Over 1 (one) stockholder: T. R. Kelly, 178 Avenue T. C. Palmer, 74 parent, 1000.

Over 2 potential sickleheads: C. M. Nelson, 1817 (over); M. C. H. H. 121 (over).

1944: Ford & Co. 5 percent; Weyerhaeuser 17 percent; National Forest 51 percent
 1944-1945: F. C. Anderson president; 1945-1946: Geo. Brown ex. 1946: Ray
 Thompson secy.; 1946-1947: secy.
 1947-1948: president; 1948-1949: F. C. Anderson

* Wassenaar-H J Harv president, some
(none); R. M Wilson near top (1900)
(1901); E. N Lewis very close (none);
D. T Myers, conf., none; H.H.H. (1908).
M. A.

◆ **William T. H. Davis**, president & partner, \$12,000 (10/1/77). H. T. Davis & Co., 11000 1st St., Dallas, Texas 75243. Dallas office: 734-1111. Home: 734-1111. Fax: 734-1111.

• **Plumber**—Robert Smith, resident 318 001

112-079107 Edward Smith vs \$15,000
112-08064 H. L. Lawrence vs \$7500
112-08064 Eugene Polak, New York,
State Officer, W F Long South Carolina
New York State

Over 5 personal advertisements, W F Long,
New York State

[illegible]

Over 4 percent; stockholders: L. N. Sammons, Charles Johnson and E. Y. Underwood, 10 percent; H. Y. Lewis, 17 1/2 percent; Nathan Aronson, Inc., Winston N. J., 24 percent; F. K. Huxley, New York, 1 percent.

Over 1 patent infringement: F W Hulse, 5442 Federal, Jackson International Co., Montgomery, Ala., 117 Federal, West &

► **Redwood** — **Larrea tridentata** Wood. Shrubland zone: Coahuila, J. R. Conzatti, president, 812-100 (81100); T. R. Mitchell, Jr. 812-100 (81100); A. W. Johnson, train, 812-100 (81100). **Wetland** **Rudra** spp., near Mexico: C. M. Ruffalo, 812-100 (81100).

[illegible]

Ovoviviparous stenobionts, B. E. Melnikova, 143 persons; L. O. Mikheeva, 104 persons; M. A. E. Melnikova, 91 persons.

• **Wood Coast—**Wick Van Overbeek, 19110
Hillside, R. A. Mason rd. 912-940 (Hill-
side); William Gervet, 79 some Green,
R. A. Dunn way drive, 91101; © R.
Duke, no address from around May 15, 1948.

Over 5 percent monochlorides: Nigdy Ran, 98.1 percent; Antikaribidoo, Parker & Bannock, New York 98.4 percent; The Ma-

agents the new airport service more economically than Colorado, which does not now serve Toronto.

Colorado controls that it needs the Toronto-New York route to compensate for the loss of revenues resulting from CAA's withdrawal of Trans-Canada to operate competitively between Montreal and New York. Roblin delivered, however, that far from benefiting Colorado, the new link would only increase its operating deficit.

Miami Weather Fine

Miami points proudly to its pleasant weather as having the best weather of five leading U.S. air terminals. Citing newly released U.S. Weather

Bureau data, Miami says its field has the best weather conditions (on least 1990) it could and three are exhibiting during 97 percent of the year. The terminal has instrument conditions (569,706) it could and two-thirds are visible (x) two percent of the time, and it closed the remaining one percent.

► **Oliver Keeler-Miller** airport ranking closest to Miami is New Orleans, with 91 percent correct weather, six percent instrument and three percent closed. Los Angeles field showed 81 percent correct, 13 percent instrument and four percent closed, Chicago 77 percent correct, 18 percent instrument and four percent closed, and Los Angeles 90 percent correct, 15 percent instrument and five percent closed.

SHORTLINES

► **American**—Reports \$1,611,235 net loss for first quarter 1990 after tax carryback credit of \$528,000, compared with \$224,322 net loss (before tax loss credit) in same period 1989. Principal reason for higher deficit this year was loss of revenue during eleven days of March when only about 40 percent of the schedule was operated and 46 percent of reserved traffic was carried because of a strike by maintenance employees. Traffic recovered last later in March and during last half of April was ahead of same 1989 period.

► **American Overseas**—Will merge into through service from New York to Düsseldorf and Cologne, Germany, June 1.

► **BOAC**—British Labor government has agreed members of Parliament that facing Seniors and by BOAC as assembly, despite ones of engine failure which forced the crash to return to the base on scheduled trans-Atlantic flights. It was reported that the Seniors had been forced back because of engine trouble on only 13 of 425 flights.

► **Capital-Air**—Announced its revenue from special charter flights in first quarter 1990 as compared to the same 1989 period. Receipts totaled \$163,682 against \$93,476 in the first-quarter last year, \$22,651 in first-quarter 1989 and \$14,660 in first-quarter 1987. Net operating loss in February was \$80,577 compared with \$177,900 in the same 1989 month.

► **Coltair**—Carrier is asking CAB permission to cut its Washington-Berlin route from \$126 to \$17.

► **Eastern**—Capt. E. V. Ruckelshaus, EAL president, has attacked unscrupulous tactics for exploiting the sympathies of "gentlemen" groups by their claim that they were originally composed of war veterans. "Eastern alone has more veterans in its employ than all the non-scheduled agencies combined," Ruckelshaus declared.

► **Intercontinental Flight Radio Officers Air Safety Organization**—Has asked CAB to seek a temporary emergency regulation requiring use of the 191 kHz maritime radio-telephone duplex frequency and qualified personnel on remote flying trans-Atlantic and trans-Pacific flights. The group said an emergency regulation is needed because CAA is permitting Pan American Airways to eliminate all flight radio officer personnel by July 1, despite CAA's announcement (Aviation Week Apr. 7) that it will permit no new safety regulations regarding 290 kHz.

► **Miami**—Airport Director A. B. Curry has recommended to CAA's Airport Use Committee that a military field be established as an auxiliary to Miami Inter-

national Airport, which is handling a steadily increasing volume of aircraft civil traffic.

► **Nad-West**—The freedom earned 1328 passengers and \$1,912.10 of cost in its single engine Cessna 395 during first-quarter 1990. Cessna completed 76.6 percent of its scheduled flights and carried passengers an average of 146 seats.

► **Pan American**—Has received CAB permission to suspend service at Midway field until June 30, 1991.

► **Sabena**—The Belgian airline carried 168,684 passengers in 1989, compared with 160,111 in 1988.

► **Swissair**—Plans to start a cruise night air coach service between London and Zurich this month, using DC-10 and Conquest-Liners.

► **Transamerica**—Has been refused a CAB exemption to make a round-trip flight from Los Angeles to London carrying British war brides.

► **TWA**—Passenger flights from New York to Europe will be resumed to 33 destinations weekly on June 1. Twelve of 40 seats for 10 new Conquests have been placed in international service.

► **United**—DC-10s are now accounting for almost 50 percent of the carrier's domestic unit output.

► **Western**—Last month celebrated its 24th year of continuous operation.

► **Western**—Loses two WJL and its subsidiary, United Air Lines, had a \$62,951 net profit in 1989, compared with a \$174,704 profit in 1988.

Western Air Lines of California, associate carrier to which WJL leases equipment, flew 31,900 passengers and had an 84 percent load factor in March.

CAB SCHEDULE

May 10—Publishing conference on Washington, D.C. (10:00-11:00).

May 11—Reviewing an CAA's proposed action against 200-hour Air Transport Pilot School System (10:00-11:00).

May 12—Reviewing an CAA's proposed action against 200-hour Air Transport Pilot School System (10:00-11:00).

May 13—Reviewing an CAA's proposed action against 200-hour Air Transport Pilot School System (10:00-11:00).

May 14—Reviewing an CAA's proposed action against 200-hour Air Transport Pilot School System (10:00-11:00).

May 15—Reviewing an CAA's proposed action against 200-hour Air Transport Pilot School System (10:00-11:00).

May 16—Reviewing an CAA's proposed action against 200-hour Air Transport Pilot School System (10:00-11:00).

May 17—Reviewing an CAA's proposed action against 200-hour Air Transport Pilot School System (10:00-11:00).



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